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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/096,113	06/11/98	HOYLER G	P98.0518

LM01/0228

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EXAMINER	
JONES, H	

ART UNIT	PAPER NUMBER
2763	6

DATE MAILED: 02/28/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/096,113	Hoyler
Examiner	**Group Art Unit**
Hugh Jones	2763

☒ Responsive to communication(s) filed on *Feb 23, 2000*

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) *1-20* is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-20* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-20 rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Specifically, applicant is attempting to claim an algorithm. There is no pre- or post-processing of real data. This rejection was asserted in paper # 4 and is maintained here.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 12 recites the limitation "stability" in line 1. There is insufficient antecedent basis for this limitation in the claim.

5. Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claim 12: "stability of said body" with respect to what?

- Claim 13: "compatibility" with respect to what? (Examiner appreciates the meaning of electromagnetic compatibility - the question has to do with victim and aggressor nets).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3 and 14-15 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Rokhlin et al. (3/97).

8. Rokhlin et al. disclose: *Scalability of the Fast Multipole Method for the Helmholtz Equation*; and discloses details of multipole expansions, matrix methods and regions. See sections 1-5.

9. Claims 1-3 and 14-15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Stalzer (Parallel Processing Letters - 1995) or Stalzer (1995; from the optical physics laboratory) or Coifman et al..

10. Stalzer discloses: *A Parallel Fast Multipole Method for the Helmholtz Equation*; and discloses details of multipole expansions, matrix methods and regions. See sections 1-2, 4 and 7.

11. Stalzer (1995; from the optical physics laboratory) discloses details concerning the fast multipole method and grouping. See particularly: abstract; pg. 326 (FMM Formulation, wherein grouping is discussed).

12. Coifman et al. disclose: *The Fast Multipole Method for the Wave Equation, A Pedestrian Prescription*; and disclose details of multipole expansions, matrix methods and regions. See entire disclosure and note fig. 2.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. **Claims 4-13 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Stalzer (Parallel Processing Letters - 1995) or Stalzer (1995; from the optical physics laboratory) or Coifman et al.] in view of the taking of official notice.**

15. Stalzer (Parallel Processing Letters - 1995) discloses: *A Parallel Fast Multipole Method for the Helmholtz Equation*; and discloses details of multipole expansions, matrix methods and regions. See sections 1-2, 4 and 7.

16. Stalzer (1995; from the optical physics laboratory) discloses details concerning the fast multipole method and grouping. See particularly: abstract; pg. 326 (FMM Formulation, wherein grouping is discussed).

17. Coifman et al. disclose: *The Fast Multipole Method for the Wave Equation, A Pedestrian Prescription*; and disclose details of multipole expansions, matrix methods and regions. See entire disclosure and note fig. 2.

18. [Stalzer or Stalzer or Coifman et al.] do not disclose the limitations of claims 4-13 and 16-20 which disclose minor details concerning the mechanics of the multipole expansion (such as size of or distance to different regions and details concerning different frequency bands to be investigated); however, official notice is taken that these details would have been obvious to one of ordinary skill in the art at the time of the invention.

19. **Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Turner et al. or Berne et al.] in view of the taking of official notice.**

20. Turner et al. (U. S. Patent 5,424,963) disclose a molecular dynamics simulation and method. They teach grouping in terms of molecular dynamics as well as electromagnetics. See particularly: abstract; figs. 1-8 (especially 7; electromagnetic multipole expansion); fig. 15; col. 1, lines 20-66; col. 4, line 63 to col. 6, line 20; col. 7, lines 29-68; section D (cols. 17-23).

21. Berne et al. disclose: multipole methods and grouping: See: abstract; col. 1, lines 35-4; col. 2, lines 1-32; col. 3; col. 5, lines 16-39; col. 6, lines 7-33; col. 6, line 63 to col. 10 (fast multipole method); col. 13, lines 10-17; col. 14, lines 25-38 (boxes);

22. Turner et al. or Berne et al. do not disclose the limitations concerning matrix operations as per the multipole expansion (although Berne et al. does reference such methods: col. 26, lines 45-46); however, official notice is taken that these details would have been obvious to one of

ordinary skill in the art at the time of the invention. They also do not disclose the limitations of claims 4-13 and 16-20 which disclose minor details concerning the mechanics of the multipole expansion (such as size of or distance to different regions and details concerning frequency bands to be investigated); however, official notice is taken that these details would have been obvious to one of ordinary skill in the art at the time of the invention.

Response to Arguments

23. Applicant's arguments filed 2/23/00 have been fully considered but they are not persuasive.

24. Applicant has argued that the claims are statutory (pp. 1-3 of paper # 5). This presents an issue that was dispositively addressed in the case *In re Warmerdam*, 33 F. 3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994).

25. In that case, the Court addressed an issue where the Applicant claimed an invention where abstract ideas were represented by "bubbles" and were given the structure of a "bubble hierarchy" in the invention's database. The Federal Circuit held that "*the dispositive issue* for assessing compliance with Section 101 in this case is whether the claim is for a process that goes beyond simply *manipulating 'abstract ideas' or 'natural phenomena'* ... As the Supreme Court has made clear, [a]n idea of itself is not patentable, ... *taking several abstract ideas and manipulating them together adds nothing to the basic equation.*" *In re Warmerdam* 31 USPQ2d at 1759 (emphasis added). On that basis, the Court held the "bubble hierarchy" of *Warmerdam* to be nonstatutory.

26. Consider claim 1. Applicant is claiming a simulation to determine the electromagnetic fields of a body. There is no real world data which is obtained by sensors, and there is no output processing of the simulated data. Applicant is simply attempting to claim an *algorithm*.

27. Applicant's arguments concerning the 112 rejection (page 4 of paper # 5) are not persuasive. Examiner still can not determine the meaning of the terms in the *context* of the claims.

- Claim 12: "stability of said body" with respect to *what*?

- Claim 13: "compatibility" with respect to *what*?

As Examiner stated in paper # 4, and in response to Applicant's current remarks (page 4 of paper # 5), Examiner understands the idea behind the terms. However, the use in the context of the claims is *ambiguous*.

28. Applicant has remarked (pages 4-5 of paper # 5) on the following (page 3 of paper # 4):

> "Applicant appears to be claiming details concerning multipole expansions of various near- and far-field regions and superimposing the results - this is well known in the arts - in fact, the matter claimed in the independent claims is taught in undergraduate college electromagnetics courses; the matter taught in claim 2 is taught in graduate electromagnetics courses (equivalent circuit models for electromagnetics problems). Applicant is referred to standard textbooks (see Jackson, *Classical Dynamics*, for example)."

The remarks were intended for Applicant's benefit. In so far as the remarks were presented prior to the actual art rejection, it is clear that the remarks were not intended as part of the art rejection. Examiner respectfully, but strongly, disagrees with Applicant's characterization of paragraph 6 as a gross over-simplification of the claimed subject matter (page 5 of paper # 5). Applicant is again referred to J. D. Jackson or any other standard textbook on electromagnetics.

29. Applicant essential argument is that the art *"does not teach or suggest the use of a global multi-pole or a local multi-pole expansion in the context of identifying electromagnetic fields"* (lines 5-6 of page 5 of paper # 5, and throughout the rest of paper # 5). Examiner has carefully reexamined the specification to determine Applicant's definition of *global multi-pole and local multi-pole expansion*. Page 3 (lines 10-19) of the specification recites:

> "In each of the plurality of subregions, a global multipole expansion is made which represents the effect of the charges and currents for distant points in the form of a multipole expansion, and a local multipole expansion is made, which represents the effect of the charges and currents at points inside this one of the plurality of subregions in the form of a multipole expansion. The electromagetic field of the body is determined by superposition using the global multipole expansion and the local multipole expansion for the plurality of subregions."

What is the difference between the matter above and the concept of near-field and far-field approximations? Applicant is again referred to J. D. Jackson or any other standard textbook on electromagnetics for this basic concept. With respect to the art rejections, the Examiner has specifically directed Applicant's attention to pertinent passages in the cited art. For *example*, Stalzer (1995; from the optical physics laboratory) discloses details concerning the fast multipole method and grouping. *See particularly: abstract; pg. 326 (FMM Formulation, wherein grouping is discussed)*. See, also: Stalzer discloses: *A Parallel Fast Multipole Method for the Helmholtz Equation*; and discloses details of multipole expansions, matrix methods and regions. See sections 1-2, 4 and 7. *Page 265 discloses details concerning near- and far-field computations and the*

*concept of **grouping***. Applicant has not provided the Examiner with any credible evidence that Applicant is claiming a novel step beyond that disclosed in the prior art.

30. As per comments on lines 3-8 of page 6 of paper # 5; Applicant's attention is directed to the art rejections and the cited art. As per comments on lines 5-10 and 15-19 of page 7 of paper # 5, Applicant has only provided an assertion without any basis in fact. As per comments on lines 11-14 of page 7 of paper # 7; Examiner can only speculate as to the intended meaning - what is the difference between an electromagnetic field of a body, electrostatic reactions and electrostatic interactions in terms of electroamagnetic calculations? With respect to comments in lines 20-23 of page 7 of paper # 5; Applicant's attention is directed to the art of record as well as J. D. Jackson or any other standard textbook on electromagnetics for this basic concept.

31. Regarding comments concerning motivation to modify (page 6 of paper # 5); Applicant is referring to the assertion by the Examiner that: "*disclose details of multipole expansions, matrix methods and regions*" (paper # 4). These are minor details which pertain to how the expansion is actually implemented - they are not directed at the core issue, namely whether "*local*" and "*global*" expansions are a novel teaching. Furthermore this is not a question of motivation. The cited art teaches, for example, matrix methods. Presumably, the authors of those works would be familiar with the basics of matrix operations; the particular operation and sequence of various operations would depend on the desired outcome. In any case, Applicant has not provided a credible case or substantial argument in response to Examiner's taking of the Official notice.

32. Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

Conclusion

33. Applicant's amendment (claim 12) necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

34. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Hugh Jones whose telephone number is (703) 305-0023.

Dr. Hugh Jones

February 26, 2000

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER